(3 SHEETS)
SHEET I.

'81. Nov. 30. No. 5245.
U.S. SPECIFICATION.

~~170~~ 4161
1140

Duplicate of German 17040 (115-44)

Blades automatically reverse pitch on reversing rotation

FIG. 1.

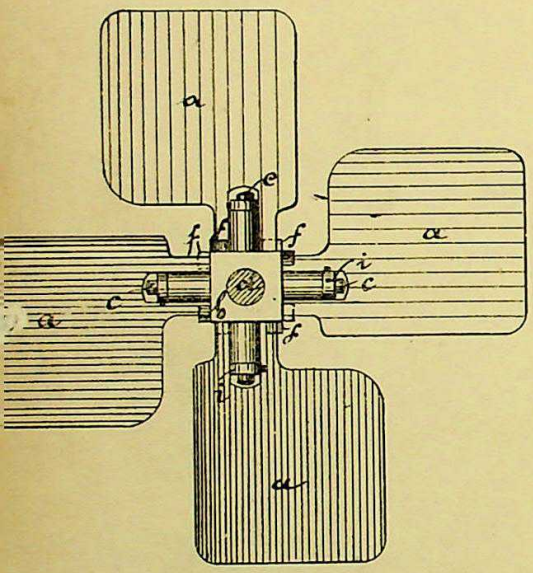

FIG. 3.

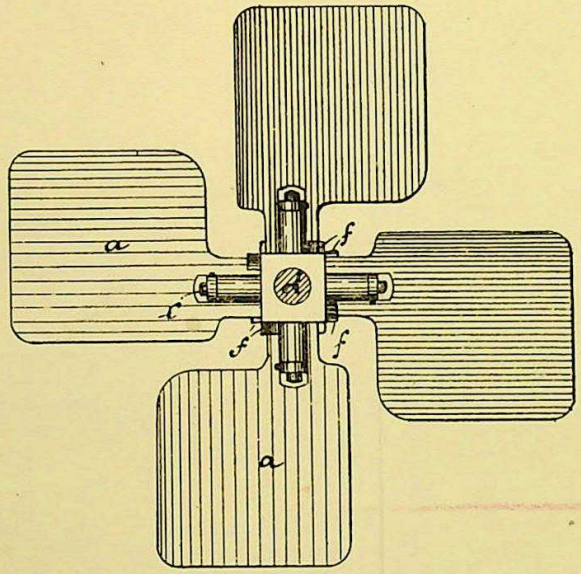

FIG. 5.

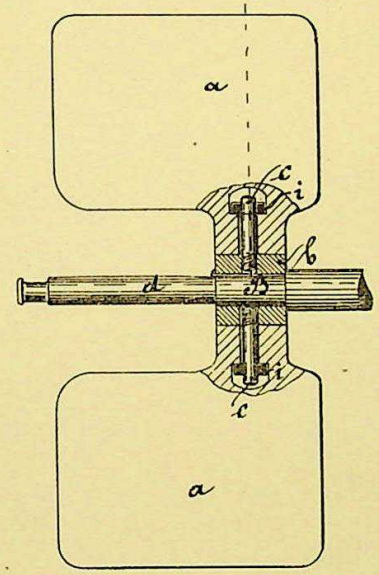

FIG. 5. a.

(ABEL)

FIG. 2.

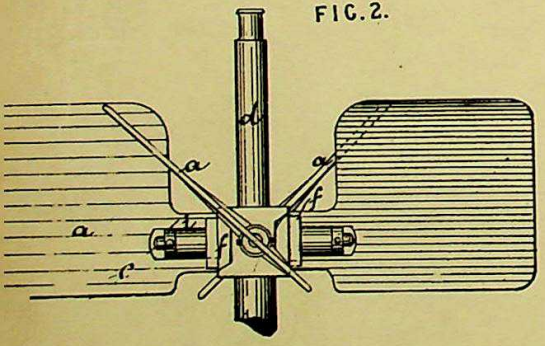

FIG. 4.

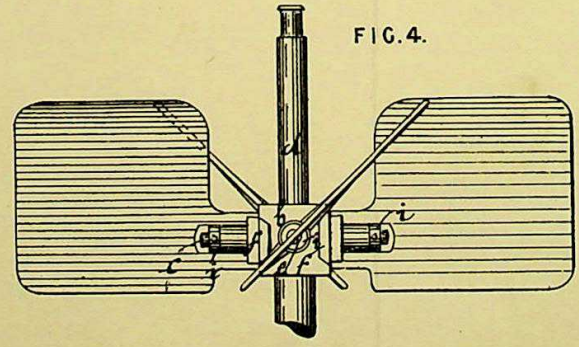

FIG. 6. a.

FIG. 6.

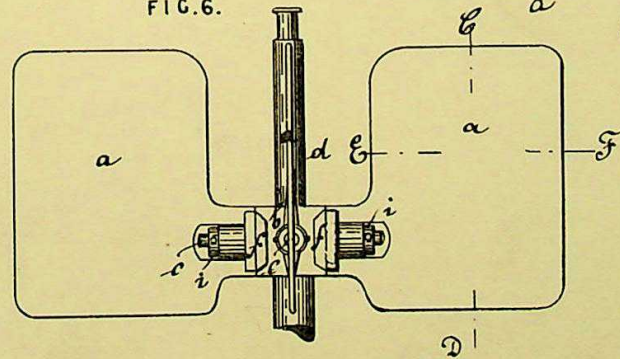

FIG. 6. b.

#5,245
A.D. 1881
BRITISH

A.D. 1881, 30*th* NOVEMBER. N° 5245.

Ships' Propellers, &c.

LETTERS PATENT to Charles Denton Abel, of No. 28, Southampton Buildings, Chancery Lane, in the County of Middlesex, for an Invention of "IMPROVEMENTS IN SHIPS' PROPELLERS AND APPARATUS IN CONNECTION THEREWITH." A communication from abroad by Johann Anton Andrée, of Esens, Ostfriesland, Germany.

PROVISIONAL SPECIFICATION left by the said Charles Denton Abel at the Office of the Commissioners of Patents on the 30th November 1881.

CHARLES DENTON ABEL, of No. 28, Southampton Buildings, Chancery Lane, in the County of Middlesex. "IMPROVEMENTS IN SHIPS' PROPELLERS AND APPARATUS IN CONNECTION THEREWITH." [A communication from abroad by Johann Anton Andrée, of Esens, Ostfriesland, Germany.]

This Invention has reference to a construction of ships' propellers in which the blades or vanes are pivotted to a central boss in such a manner that on rotating the propeller alternately in opposite directions the blades will be made by the pressure of the water to assume alternately opposite angular positions so as to propel the boat forward in whatever direction the propeller is rotated.

For this purpose the area of the blade on the forward side of the axis on which it pivots is made less than the area on the rear side, so that the blade will, by the pressure of the water, always be made to assume an angular position (which is limited by stops) suitable for propelling the vessel forward in whichever way it is rotated. This construction of propeller is more particularly adapted for propelling small boats by treadle action, for which purpose the apparatus may be arranged in various ways. According to one arrangement the propeller is mounted on a short shaft in front of the rudder in the usual manner, the shaft being provided with a pulley round which passes an endless band leading up to the deck, and round a guide pulley in a horizontal position. To the opposite parts of the endless band are attached cords that are led either over guide pullies to treadles, or they are provided with handles to be worked by the hand, so that on pulling at these cords alternately by the hands or by the action of the treadles the endless band

is made to travel a certain distance alternately in contrary directions, and it thus causes the propeller to perform a certain number of revolutions first in one direction and then in the other. There may also be provided two other propellers on shafts, one on each side of the above mentioned one, and driven therefrom by means of pullies and endless cords, so that by rotating the middle propeller as described the two side ones are simultaneously rotated in the same direction. According to another arrangement the propeller is mounted on the end of a shaft that passes down in an inclined position from the stern of the boat; the shaft is mounted with its upper end in bearings on a frame that can swivel on a centre fixed in the stern of the boat, and it has a pulley round which is led an endless strap passing over guide pullies in a horizontal direction to a guide pulley in the forward part of the boat, so that by imparting a to and fro motion to the endless band by hand or treadle, as above described, the shaft and propeller will be rotated alternately in contrary directions. The swivelling frame has a handle by which it can be moved into varying angular positions, and thus the shaft and propeller in assuming corresponding angular positions relative to the longitudinal axis of the boat will effect the steering of the latter.

According to another modification one of the said propellers may be mounted on each side of the boat at any convenient forward position, in brackets passing down from a transverse bearer overhanging the sides of the boat, the motion being imparted to the propellers as before by an endless band led over guide pullies down to each propeller shaft, and receiving a to and fro motion either by hand or by treadle.